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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

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TITLE

# LOSSES IN SUGAR PINE ON CUTOVER AREAS DUE TO THE MOUNTAIN PINE BEETLE, SIGNAL PEAK UNIT, SIERRA NATIONAL FOREST

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By
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Berkeley, California
April 22, 1941

SUBJECT—

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Forest Insect Laboratory
Berkeley, California
April 22, 1941

# LOSSES IN SUGAR PINE ON CUTOVER AREAS DUE TO THE MOUNTAIN PINE BEETLE.

## SIGNAL PEAK UNIT, SIERRA NATIONAL FOREST.

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# LOSSES IN SUGAR PINE ON CUTOVER AREAS DUE TO THE MOUNTAIN PINE BEETLE. SIGNAL PEAK UNIT, SIERRA NATIONAL FOREST

The loss of sugar pine seed trees left to restock logged areas, due to the activity of the mountain pine beetle, at times is a serious problem. The most recent aggressive attack of this kind occurred on the Signal Peak unit, logged in 1928 by the Madera Sugar Pine Company. The flare-up took place beginning in 1935 and subsided in 1940, during which time 5 percent of the residual stand volume was killed.

In recognition of the importance of insects on cutover areas, the Bureau of Entomology and Plant Quarantine, in 1934, established plot CO-17 on the Signal Peak area, consisting of 160 acres in section 34, T 4 S, R 20 E*. The main purpose of the plot was to follow the trends of barkbeetle activity and the depletion caused, by making annual examinations of the area. The plot was set up for intensive study, account being taken of the stocking of all timber species, reproduction, andd ground cover.

A summary of the main features of this plot is as follows:

Location - NE ¼ of Sec. 34, T 4 S, R 20 E, M.D.M.
Area - 160 acres.
Exposure - Northeast.
Ownership - U. S. Government.
Altitude - 6,800 feet.
Sugar pine stocking -
Original volume per acre - 29,592.
Volume per acre left - 6,337.

| Sugar pine losses - | Per Acre | |
|---|---|---|
| | Trees | Volume b.m. |
| Stand at beginning of 1932 | 7.08 | 6,337 |
| 1932-1933 losses | 0.019 | 28.25 |
| Loss per year | 0.010 | 14.13 |
| Percent loss per year | 0.14 | 0.22 |

Sugar pine increment per acre per year -
Volume - 162.19 b.m.
Percent of stand - 2.55.

Net gain per acre per year -
Volume - 148.06.
Percent of stand - 2.33.

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* K. A. Salman. A Survey of Forest Insect Investigations on Cutover Areas in California. January 1935.

Lack of funds precluded continuance of surveys on this plot following its establishment in 1934. However, in 1937, following an upbuilding of mountain pine beetle activity, a survey was made of 1,600 acres of the Signal Peak area, including the plot area. A survey of the same area of 1,600 acres was completed in 1939. From these surveys an accounting of all losses dating back to 1935 was made. The distribution of losses showed lightest on plot CO-17 and the heaviest on the east ½ of Section 1, T 5 S, R 20 E. For this reason the east half of Section 1 was established as a more adequate sample of the Signal Peak area for annual loss coverage.

A brief description of this plot, designated as Signal Peak MPB Study Plot, is as follows:

Location - East half of Section 1, T 5 S, R 20 E.
Area - 320 acres.
Ownership - U. S. Government.
Altitude - 6,500 feet.
Stocking and species - Similar to plot CO-17.
Insect losses for 6-year period, 1935-1940 -

| Year | Trees | Total volume | Vol./Acre | % of Tot. Vol. |
|---|---|---|---|---|
| 1935 | 4 | 27,830 | 86.9 | .013 |
| 1936 | 22 | 6,560 | 20.5 | .003 |
| 1937 | 10 | 16,800 | 52.5 | .008 |
| 1938 | 20 | 25,500 | 79.6 | .012 |
| 1939 | 18 | 22,750 | 71.0 | .011 |
| 1940 | 2 | 5,140 | 16.0 | .003 |
| Totals | 76 | 104,580 | 326.5 | .05 |

As seen by these figures, the greatest losses occurred during 1935, 1937, 1938, and 1939, following 2 winters (1935 and 1938) in which blowdowns caused by heavy winter storms occurred. In each case the blowdowns were quite definitely tied in with increased insect activity.

Based on figures obtained from plot CO-17, the increment on the MPB Study Plot more than offset the losses during the period of barkbeetle activity. The total volume per acre loss during this period amounted to 326.8 b.m. per acre, while the increment amounted to 740.30 b.m. per acre. This indicates a net increment during the 6-year period of 413.50 board feet per acre.

The conclusions to be drawn from this data are:

1. Losses on this cutover area were probably greater than can normally be expected on cutover areas, even during a peak of bark beetle activity.

2. Even though 5 percent of the stand volume, as of 1932, was depleted, the increment during the period of insect activity more than doubled the loss.

3. Since no studies have been undertaken on the effect of seed trees loss on the establishment of sugar pine seedlings, no conclusions can be drawn on this point. The actual loss of seed trees amounted to slightly over 3 percent. This loss would probably not materially affect the establishment of seedlings.

The 1940 cruise of plot CO-17 showed the loss of 1 sugar pine having a volume of 5,500 feet b.m. This tree was struck by lightning earlier in the year, and hence cannot be considered in the same light as other insect losses.

U. S. BUREAU OF ENTOMOLOGY & PLANT QUARANTINE

# CUTOVER PLOT SEVENTEEN

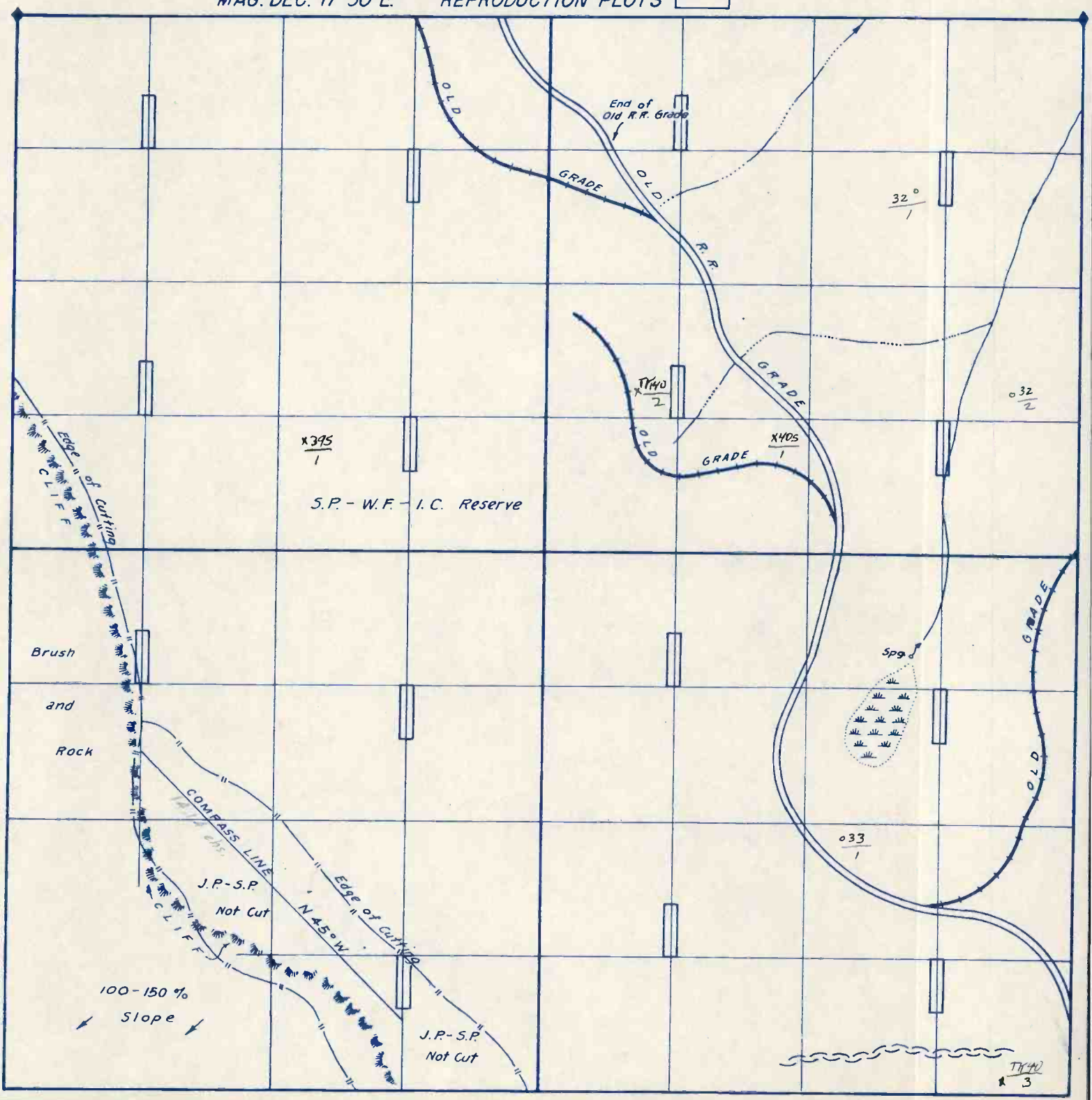
SIERRA NATIONAL FOREST, CALIFORNIA

NE 1/4 SEC. 34; T. 4 S.; R. 20 E.; M.D.M.

DATE _____ SCALE: 16" = 1 MI.

CREW _____

MAG. DEC. 17°30' E. REPRODUCTION PLOTS ☐



# SIGNAL PEAK

## M. P. B. STUDY PLOT

*D. MONTICOLAE LOSS - 1938 TO 1940.*

**E. 1/2 SEC. 1 T 5 S R 20 E**

SCALE : 8" = 1 MI.